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**United States Patent** [19]  
**Boisvert et al.**

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[54] **POWER WINDOW OR PANEL CONTROLLER**

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[73] Assignee: **Nartron Corporation**, Reed City, Mich.

[21] Appl. No.: **08/795,971**

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**Related U.S. Application Data**

[63] Continuation-in-part of application No. 08/736,786, Oct. 25, 1996, abandoned, which is a continuation of application No. 08/275,107, Jul. 14, 1994, abandoned, which is a continuation-in-part of application No. 07/872,190, Apr. 22, 1992, Pat. No. 5,334,876.

[51] **Int. Cl.**<sup>6</sup> ..... **E05F 15/14**  
[52] **U.S. Cl.** ..... **318/468; 318/469**  
[58] **Field of Search** ..... **318/469, 466, 318/455, 458, 434, 468, 470, 447, 256, 264, 265, 266, 286; 49/26, 28**

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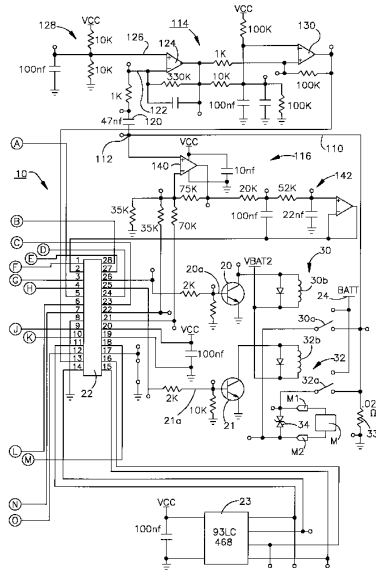
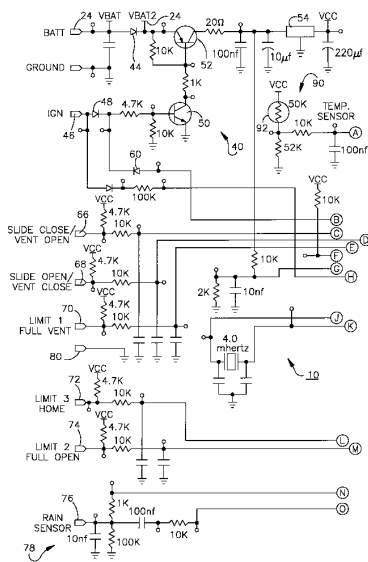
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[57] **ABSTRACT**

A controller for energizing a power window or panel such as a power sunroof. The disclosed controller senses both hard and soft obstructions and de-activates a motor that moves the sunroof when an obstruction is detected. The controller senses obstructions by maintaining data relating to motor operation in three different memory buffers that are periodically updating upon receipt of pulses that are related to motor speed.

**26 Claims, 12 Drawing Sheets**



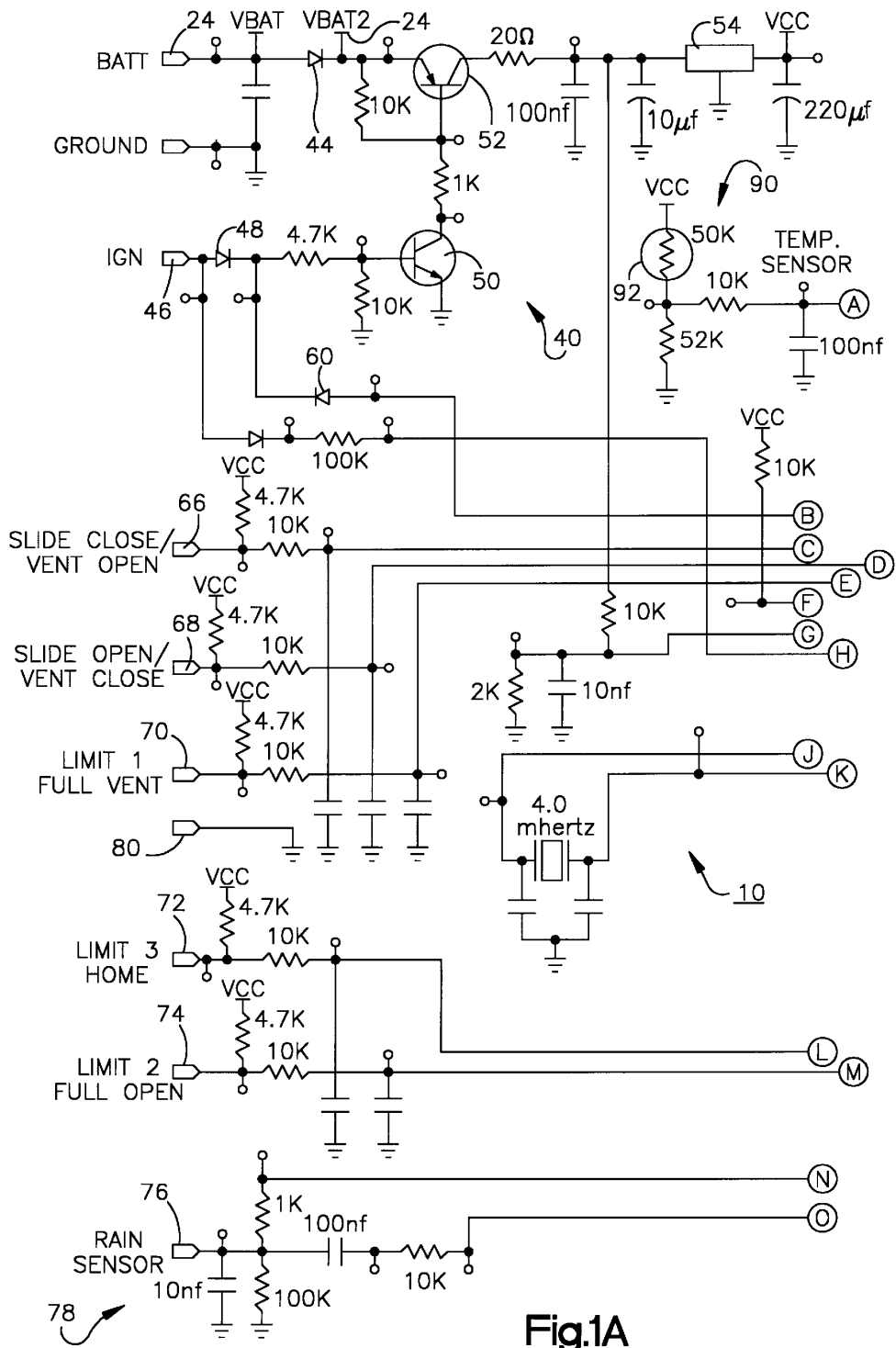


Fig.1A

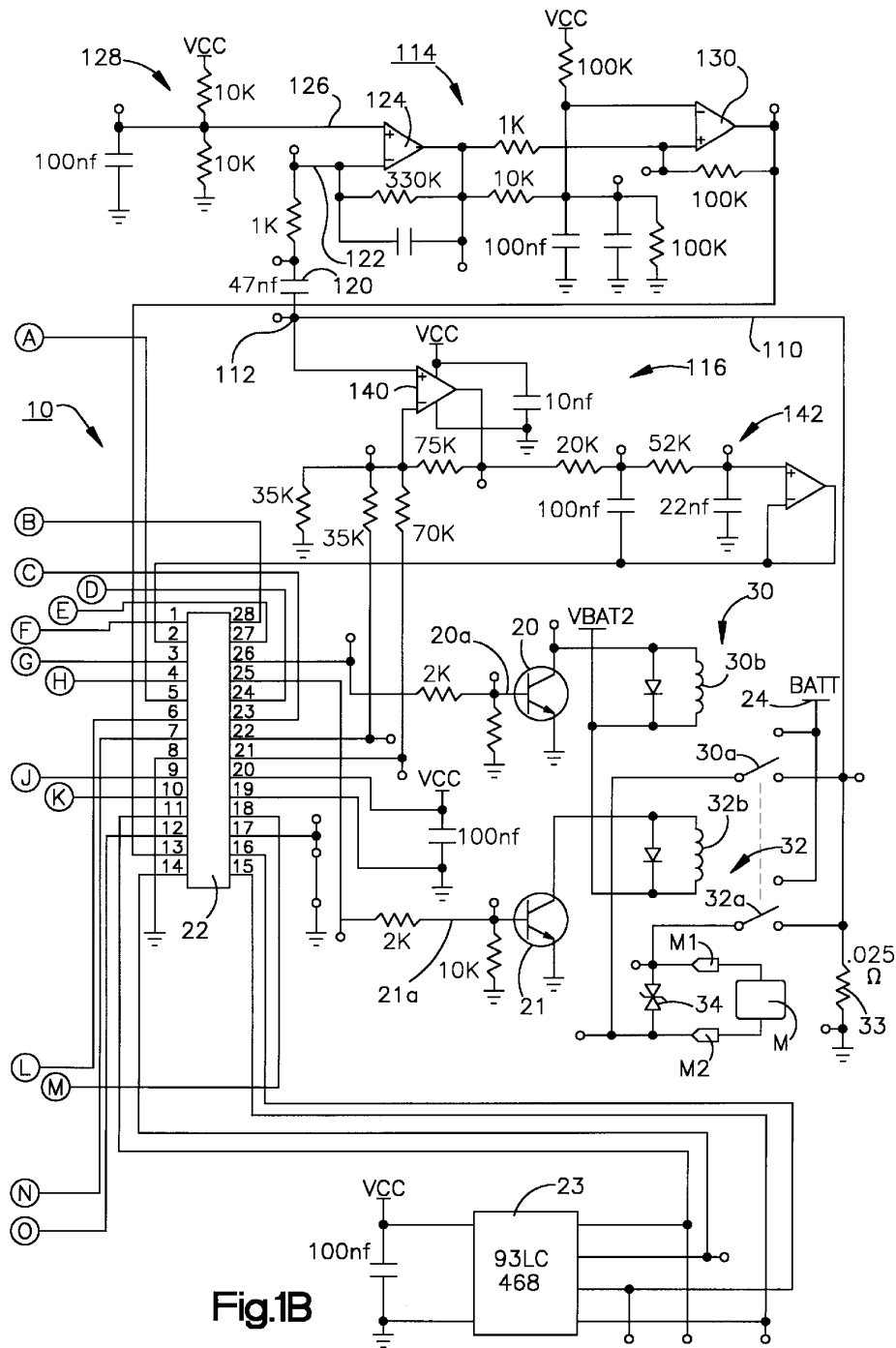


Fig.1B

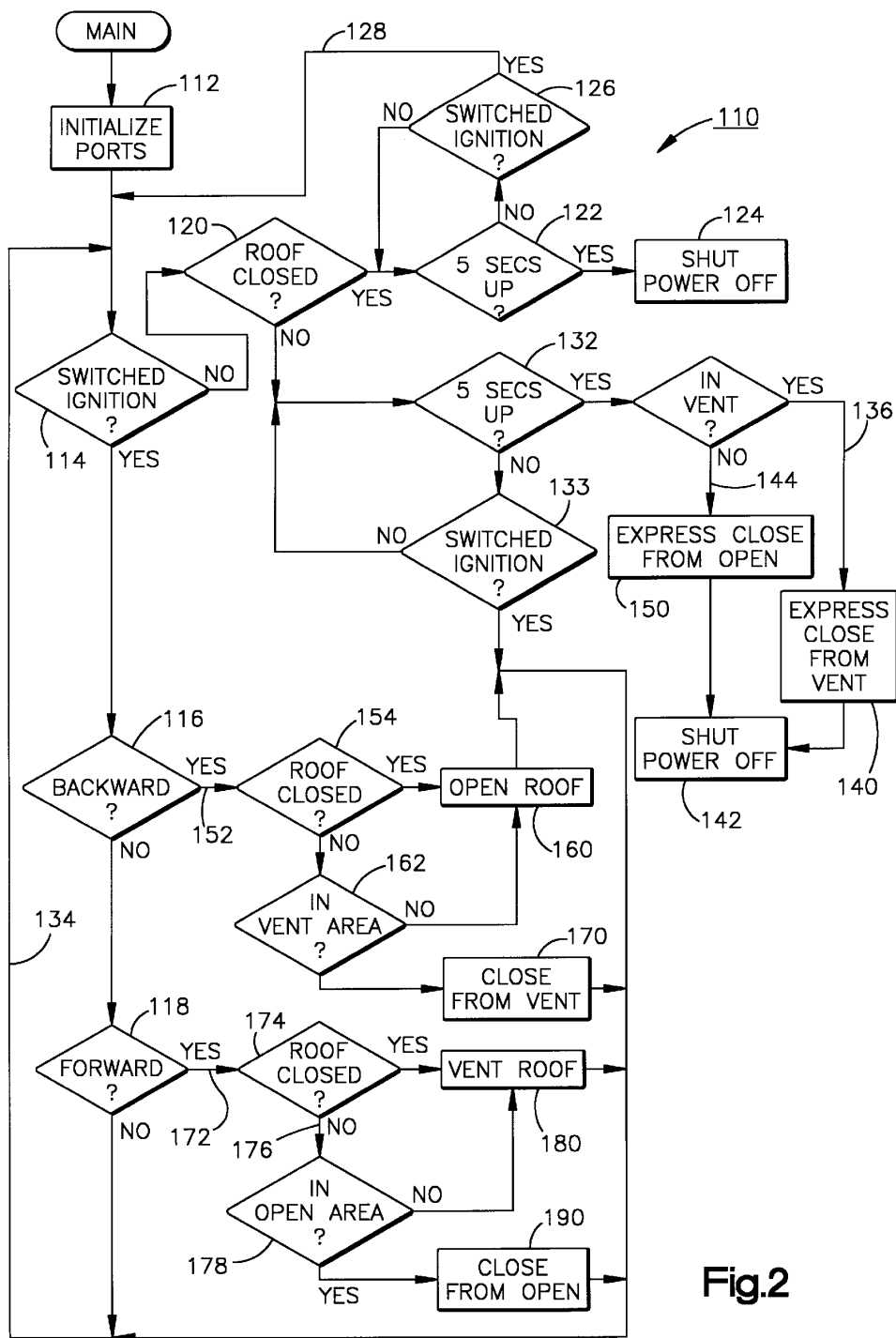


Fig.2

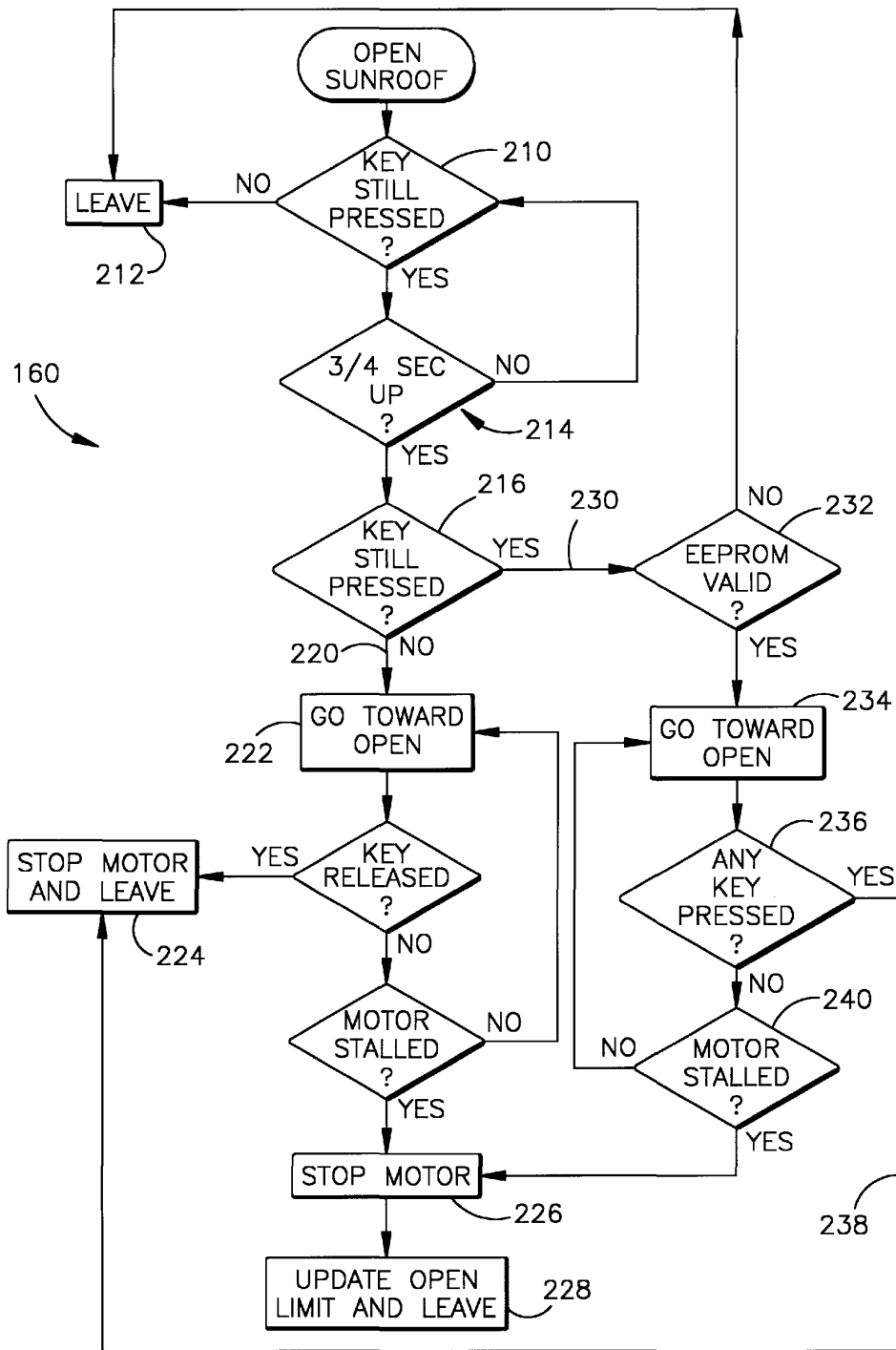


Fig.3

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